Short Communication

Application of Electrochemically Synthesized Zinc Oxide Nanorods/Fava Bean Starch biocomposite in Food Active Packaging

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Fava bean starch (FBS) nanocomposite films with ZnO nanorods (NRs) filler were successfully prepared and characterized. ZnO NRs powder was synthesized using a simple electrochemical method in large-scale production. ZnO NRs as a physical cross-linking to reduce the starch thermal decomposition indicated significant improvement in the thermal stability of biopolymer samples. A huge difference in the electrical conductivity and relative dielectric constant was observed by increasing the ZnO concentration in the FBS matrix. The localization of charge carriers in the ZnO/FBS biopolymers can result in the enhancement of the antibacterial properties of starch-based polymer through the electrostatic discharge between ZnO NRs and bacteria. Biocomposite films incorporated with ZnO NRs revealed excellent antibacterial activities and thus can be used as an active packaging material to ensure safety of packaged foods and pharmaceuticals.

Keywords: ZnO/FBS biopolymer films; Electrochemical method; Dielectric properties; Thermal properties

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